

REMARKS

Drawings

The drawing has been objected to as being non-compliant with 37 C.F.R. § 1.84 since lettering is not of a specified height. Figure 1 and 13 have been redrawn. It is submitted that the redrawn figures are compliant with 37 C.F.R. § 1.84.

The Examiner has indicated that figure 13 does not contain reference number 318, but this reference number is referred to in the specification. It is believed that the originally filed figure 13 did contain reference number 318. Nevertheless, redrawn figure 13 contains each appropriate reference number.

The Examiner has observed that reference numbers 422, 424 and 426 appear in figure 14, but not in the specification. The specification has been amended to include recitation of reference numbers 422, 424 and 426 (paragraph starting at page 20, line 12).

In addition to the foregoing, figures 2-10 and 12 were repositioned and spread among three drawing sheets (rather than the original two sheets) so as to better fit these figures within the margin requirements.

Also, the lead lines for reference number 20a in figure 2 were improved.

Reference number 146 appearing in the specification at page 14, line 25 was added to figure 6.

Figures 11 and 14 were redrawn so as to better fit these figures within the margin requirements. In figure 11, block 228, the spelling of the word "apertures" was corrected.

The reference numbers starting with 200 in figure 12 have been changed to start with 500 to avoid overlap with the reference numbers used in figure 11 (e.g., former figure 12 reference number 212 is now 512). The changes to the reference numbers in figure 12 were also made in the specification in the paragraph starting at page 19, line 21.

Reference number 312 appearing in the specification at page 19, line 32 was added to figure 13.

In accordance with the foregoing, the original six drawing sheets are replaced with the enclosed seven replacement sheets.

It is submitted that no new matter has been added as a result of the changes to the drawing. Approval of the changes to the drawing is respectfully requested.

Specification

The disclosure was objected to since "multiplayer" should read "multilayer" at page 2, line 23. The specification has been amended to make this correction.

As indicated above, the specification has been amended to change the reference numbers for figure 12 from 200 series numbers to 500 series number, and the specification has been amended to include reference numerals 422, 424 and 426 that appear in figure 13.

Accordingly, reconsideration and withdrawal of the objection to the specification is respectfully requested.

Claim Rejections - 35 U.S.C. § 112

Claim 12 has been rejected for containing a phrase that lacks antecedent basis. Claim 12 has been amended to depend directly from claim 1 and no longer contains the phrase that previously lacked antecedent basis. Accordingly, reconsideration and withdrawal of the rejection under 35 U.S.C. § 112 is requested.

Claim Rejections - 35 U.S.C. § 102

Claims 1-12 and 18 have been rejected under 35 U.S.C. § 102(b) over U.S. Patent No. 6,479,348 to Kamal. Independent claim 1 and dependent claims 4, 5, 7, 10, 11, 12, 14 and 16 have been amended to more clearly recite that which the applicants regard as the invention.

Claim 1 distinguishes over Kamal by reciting method steps that are not taught or reasonably suggested by Kamal. For instance, claim 1 includes "forming doped regions of a first conductivity type in the substrate by implanting ion species through the charge

trapping layer using the hard mask layer to define an implant pattern of the doped regions" and "laterally diffusing the doped regions into the substrate." Buried bitlines are also formed and these steps "result in laterally diffused doped regions adjacent each buried bitline that inhibit a leakage current between adjacent pairs of buried bitlines through substrate regions disposed between the diffused doped regions."

At least these aspects of the invention are not taught or reasonably suggested by Kamal. Kamal does teach implanting a threshold adjustment implant into the substrate, but threshold adjustment implants are typically implanted uniformly across the substrate (or at least into channel regions thereof). In this regard, Kamal does not disclose any feature that corresponds to the claims supplemental doped regions adjacent bitlines.

Further, Kamal's implant methodology fails to teach or reasonably suggest implanting these doped regions through a charge trapping layer and with a pattern defined by a hard mask as set forth in claim 1. Nor does Kamal teach or reasonably suggest laterally diffusing an implant. Even if Kamal's threshold adjustment implants were somehow akin to the claimed doped regions, Kamal's threshold adjustment implant is made before the charge trapping layer is formed (see figure 11, boxes 604 and 606) and cannot be considered to be implanted through the charge trapping layer.

Not only does Kamal fail to teach or reasonably suggest the claim method, unmotivated changes to the teachings of Kamal would be required to arrive at the claimed invention.

For at least these reasons, claim 1 is considered to patentably define over the cited references. Claims 2-12 and 18 depend from claim 1 and are considered to be patentable for at least the same reasons. The dependent claims also recite additional novel and unobvious aspects of the invention. As one example, Kamal's hard mask referred to by the Examiner in connection with claim 11 is used for wordline formation rather than the claimed doped region formation and bitline formation (see, for example, figure 11, sequential boxes 610-620 and related discussion).

Accordingly, reconsideration and withdrawal of the rejection under 35 U.S.C. § 102(b) is respectfully requested.

Claim Rejections - 35 U.S.C. § 103

Claims 13-15 have been rejected under 35 U.S.C. § 103(a) over Kamal. Claim 13 has been canceled. Claims 14-15 depend from claim 1. As indicated above, claim 1 patentably defines over Kamal. Therefore, claims 14-15 are patentable for at least the foregoing reasons.

Claim 16 has been rejected under 35 U.S.C. § 103(a) over Kamal in view of Wolf (pages 298-299). Claim 16 depends from claim 1. While it is well known to repair implant damage by annealing, Wolf does not cure the deficiencies of Kamal with respect to at least the features of claim 1. Therefore, claim 16 is patentable for at least the foregoing reasons.

Claim 17 has been rejected under 35 U.S.C. § 103(a) over Kamal in view of U.S. Patent No. 5,418,176 to Yang. Claim 17 depends from claim 1. Yang does not cure the deficiencies of Kamal with respect to at least the features of claim 1. Therefore, claim 17 is patentable for at least the foregoing reasons.

Claim 19 has been rejected under 35 U.S.C. § 103(a) over Kamal in view of U.S. Patent No. 5,966,603 to Eitan. Claim 19 depends from claim 1. Eitan does not cure the deficiencies of Kamal with respect to at least the features of claim 1. Therefore, claim 19 is patentable for at least the foregoing reasons.

Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) is respectfully requested.

Added Claim

Claim 21 has been added to recite additional novel and unobvious aspects of the present invention.

Conclusion

In light of the foregoing, it is respectfully submitted that the present application is in condition for allowance and notice to that effect is hereby requested. If it is determined that the application is not in condition for allowance, the Examiner is invited

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to initiate a telephone interview with the undersigned representative to expedite prosecution of the present application.

If there are any additional fees resulting from this communication, please charge same to our Deposit Account No. 18-0988, our Order No. H0698.

Respectfully submitted,

RENNER, OTTO, BOISSELLE & SKLAR, LLP

By 
M. David Galin; Reg. No. 41,767

1621 Euclid Avenue
Nineteenth Floor
Cleveland, Ohio 44115
Telephone: (216) 621-1113
Facsimile: (216) 621-6165

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